

**REMARKS****I. Examiner Interview**

Applicants' attorneys appreciate the Examiner's courtesy in speaking with them on June 5, 2007, regarding the outstanding office action. The interview included discussion of the §101 and §112 rejections as well as discussion of the "immediate value" feature. Applicants submit that the comments below reflect the substance of the interview.

**II. Status**

Claims 1, 2, 3, 4, 7, 13, 19, 39, 40, 44, 45, 51, 52, and 56 have been amended. No new matter has been added and the amendments are fully supported by the specification. Accordingly, claims 1-20 and 39-56 are currently pending.

**III. Rejections Under 35 U.S.C. § 101**

Claims 1-20 and 45-50 were rejected as being directed to non-statutory subject matter. (Office Action, page 2). As the Examiner requested, claim 1 has been amended to recite a feature regarding a tangible result, namely "executing the reduced-width coefficient for a graphics application." Therefore, claim 1 and its respective dependent claims are directed to statutory subject matter.

In regards to independent claims 7, 13, 19, and 45, the Applicants respectfully disagree with the Examiner's rejection of these claims under §101 because these claims recite either a processor, memory, and/or machine. Because the claims are directed to physical structures, the claims as well as their respective dependent claims are directed to statutory subject matter. However, in the interest of expediting the issuance of this application, independent claims 7, 13, 19, and 45 have been amended with a similar feature as recited in independent claim 1.

**IV. Rejections Under 35 U.S.C. § 112**

Claims 1-20 and 39-56 were rejected as being indefinite. Specifically, the Examiner found the respective claim language to be vague based on the description of the preamble. (Office Action, pages 3-4). The preambles of the respective independent claims have been amended, as shown above, to clarify the relation with

the respective claim language. Accordingly, the respective rejections should be withdrawn.

## **V. Rejections Under 35 U.S.C. § 103**

Claims 1-20 and 39-56 were rejected under 35 U.S.C. §103(a) as being unpatentable over Quek et al. (U.S. Patent 5,280,439).

### **Claim 1 and Dependents**

Claim 1 has been amended to recite, *inter alia*, “generating an updated function based on the reduced-width coefficient value.” Quek et al. does not disclose at least this feature.

Quek et al. discloses an approximating function having coefficients A, B, and C. (Quek et al., column 3, lines 61-63). Quek et al. also discloses that because an approximation needs to be accurate to 28 bits at most, the coefficients do not all need to be stored to full precision. (Quek et al., column 4, lines 28-30). The coefficients are stored in a ROM 30 and are provided to registers 31, 33, and 34 for subsequent multiplexer operations. (Quek et al., column 4, lines 4-6, 32-37 and Figure 3A). However, there is no teaching or suggestion that the coefficients A, B, and C not stored to full precision are used for generating an updated approximating function. There is no mention of generating an updated function, let alone generating an updated function based on the alleged reduced width coefficients. Accordingly, claim 1 is allowable for at least these reasons. Claims 2-6 depend, directly or indirectly, from allowable claim 1 and, therefore, are allowable for at least the same reasons.

One or more of the claims dependent from claim 1, either directly or indirectly, recite features that are independently allowable. For example, claim 2 recites, *inter alia*, “generating the function based on a target function, wherein updating the function includes: updating the target function based on the reduced-width coefficient value; and generating the updated function based on the updated target function.” Quek et al. does not disclose at least these features. Quek et al. does mention a function  $1/x$  that is approximated by the approximating function (Quek et al., column 3, lines 61-63), but there is no teaching or suggestion of updating the function  $1/x$  based on a reduced-width coefficient, let alone generating an updated function, such as an updated approximating function, based on an updated target

function, such as an updated  $1/x$  function. Therefore, claim 2 is also allowable for at least these reasons.

Also, claim 3 recites, *inter alia*, "comparing the updated function with the target function, wherein storing the reduced-width coefficient value comprises storing the reduced-width coefficient value based on the comparison." Quek et al. does not disclose at least these features. Quek et al. does disclose storing coefficients of an approximating function to less than full precision (Quek et al., column 4, lines 28-30), but there is no teaching or suggestion of storing the coefficients based on a comparison between an updated function, such as an updated approximating function, and the target function,  $1/x$ . Therefore, claim 3 is also allowable for at least these reasons.

Furthermore, claim 5 recites, *inter alia*, "storing the reduced-width coefficient value as an immediate value," and claim 6 recites, *inter alia*, "storing the reduced-width coefficient value in an instruction memory." Quek et al. does not disclose at least these features. Quek et al. discloses storing coefficients in a ROM 30 (Quek et al., column 4, lines 4-6), but there is no teaching or suggestion of storing the coefficients in an instruction memory or as immediate values. Storing reduced-width coefficient values in an instruction memory reduces the number of accesses to data memory during a runtime phase. During a compile phase, immediate values may be stored with instructions in an instruction memory, and during a runtime phase, retrieval of an instruction also causes the immediate value to be retrieved. Quek et al. does not mention storing the reduced-width coefficient value as an immediate value or in an instruction memory. Therefore, claims 5 and 6 are also allowable for at least these reasons.

#### Claims 7, 13, 19, 39, 45, and 51 and Dependents

Independent claims 7, 13, 19, 39, 45, and 51 recite features substantially similar to features of claim 1 discussed above. The arguments made in regards to claim 1 appropriately apply to claims 7, 13, 19, 39, 45, and 51 as well.

Accordingly, claims 7, 13, 19, 39, 45, and 51 are allowable for at least those reasons. Claims 8-12, 14-18, 20, 40-44, 46-50 and 52-56 depend, directly or

indirectly, from allowable claims 7, 13, 19, 39, 45, and 51, respectively, and, therefore, are allowable for at least the same reasons.

One or more of the claims dependent from claims 7, 13, 19, 39, 45, and 51, either directly or indirectly, recite features that are independently allowable. For example, claims 39 and 51 recite, *inter alia*, “a reduced-width data generator,” and “generator means.” Quek et al. does not disclose these features. Quek et al. does disclose storing coefficients of an approximating function to less than full precision (Quek et al., column 4, lines 28-30), but there is no teaching of using a generator to generate reduced-width coefficient values. By not storing a value to full precision is different than reducing a value by a generator, such as by truncation or rounding. Therefore, claims 39 and 51 are allowable for at least this reason.

Also, claims 39 and 51 recite, *inter alia*, “a comparator,” and “comparing means.” Quek et al. does not disclose these features. The Examiner admits that Quek et al. does not show a comparator, but the Examiner asserts that the comparator feature has insignificant patent weight. (Office Action, page 5). On the contrary, the comparator feature is used “for performing at least one comparison based on the at least one updated function,” in regards to the apparatus for approximating a target function. Therefore, claims 39 and 51 are allowable for at least this reason.

Furthermore, claims 11, 12, 17, 18, 49, and 50 recite features similar to claims 5 and 6, respectively, as described above. The arguments made in regards to claims 5 and 6 appropriately apply to claims 11, 12, 17, 18, 49, and 50, respectively, as well. Accordingly, claims 11, 12, 17, 18, 49, and 50 are allowable for at least those reasons.

**VI. Summary**

It is respectfully asserted that all of the pending claims are patentable over the cited references, and allowance of the pending claims is earnestly solicited. If the Examiner believes that a telephone interview would be helpful in resolving any outstanding issues, the Examiner is respectfully invited to contact the undersigned at the telephone number listed below.

Respectfully submitted,

A handwritten signature in black ink, reading "Adil M. Musabji", is written over a horizontal line.

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